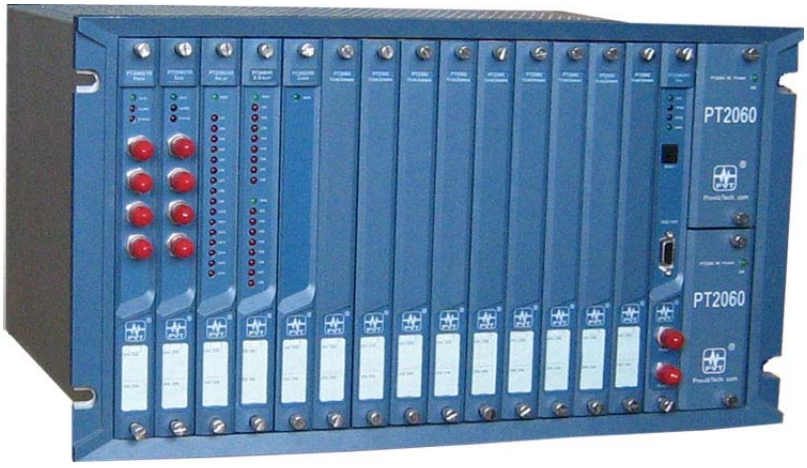
PT2060 Monitor

PT2060/43 R-RELAY Redundant-Relay Module User Manual

Installation, Operation, Maintenance



ProvibTech, Inc. 11011 Brooklet Drive, Suite 360, Houston, Texas 77099, USA

Phone: +1-713-830-7601, Fax: +1-281-754-4972, Email: pvt@provibtech.com , Web: www.provibtech.com

 COPY RIGHT PROVIBTECH 2007

Contents

Receiving Inspection and Handling Guide 3
Inspection 3
Handling and Storing Considerations 3
PT2060/43 Module Introduction 4
General Information 4
Function Table of Redundancy 4
Channels of Redundant Relay Module Definition 5
Module Description 5
Hardware 5
Software 7
Specification 7
Electrical 7
Physical 7
Environmental 8
Module Configuration and Channel Setup 9
Hardware Configuration 9
Module Configuration Setting 10
Configuration Software General Operation 10
Functions 13
Parameter Configuration 13
Hardware Module Operation 16
Maintenance 18
Instruction 18
Periodic Maintenance 18
Troubleshooting 19
LED 19
System Events List 19
Alarm Event List 20
Exceptional Module Treatment 21
Ordering Information 22
Appendix 23
PT2060/43 Led Definition 23
Definition of 43 LED 23
Definition of 53 Default LED 23
Definition of 53 individual LED 24
PT2060/43 Led and Relay Definition 24
Definition of 43 Relays 24
Definition of 53 Default Relays 25
Definition of 53 individual Relays 25

Receiving Inspection and Handling Guide

Inspection

Check the devices for possible damage that may have occurred from improper transport. Damages in transit must be recorded on the transport documents. All claims for damages must be claimed without delay against the shipper and before the installation.

Handling and Storing Considerations

PT2060 should be handled with care during unpacking and installation. Damage to PT2060 is typically caused by rough handling, shock, or electrostatic discharge (ESD).

Be aware of the following precautions when unpacking and handling PT2060 Rack or any module.

- ✓ Please have attention about the sharp corners/sides of the rack to avoid any of injuries during the installation, transporting and un-installation.
- ✓ All circuit boards and electronic modules associated with this rack contain components which are susceptible to damage caused by electrostatic discharge. It should be necessary to discharge any static electricity from yourself and your clothing before handling the rack.
- ✓ Whenever the module is not installed in a system, always keep it in the protective antistatic bag.

PT2060/43 Module Introduction

General Information

When customer requires a highly reliable system, PT2060/43 R-REALY redundant relay module(Figure1) is recommended. PT2060 system supports up to three PT2060/43 redundant relay modules mounted in slot no.4, no.8, and no.12.They combine with modules in slots (1,2,3), (5,6,7), (9,10,11) to compose a triple or dual redundant system.

Figure 1

PT2060/43 R-REALY redundant relay module includes two parts, one PT2060/43-Front module (in two groups to form double redundancy) and PT2060/43-Back module. PT2060/43 R-REALY Redundant relay module has eight relays on top as one group and another eight relays on bottom as another group. These two groups of relays work identical. Their hardware is totally separated. So the output of the redundant relay module is a standard dual redundant output.

PT2060/43 processes three alarms from the identical channels that monitoring one point. The channels are located on the left three signal conditioning modules. The alarms, together with the OK status of the three modules will be logically processed by PT2060/43. So it is a two out of three logic, or a two out of two logic with dual redundant output.

With three PT2060/53 O-SPEED modules and a PT2060/90 POWER module, it can constitute an over-speed protection system.

Especially, in the small PT2060 rack, the PT2060/43 redundant relay module of the only forth slot combines with modules in slots (1,2,3) to compose a triple or dual redundant system.

Function Table of Redundancy

Normally three channels will be logically processed. Below is the truth table.

Notes: 1 stands for alarm, 0 stands for no alarm.

Number of channel in alarm	Number of channel in no alarm	Number of NOT OK channel	Alarm
3	0	0	1
2	1	0	1
2	0	1	1
1	1	1	1
1	0	2	1
1	2	0	0
0	3	0	0
0	2	1	0
0	1	2	0
0	0	3	0

Channels of Redundant Relay Module Definition

Relay/LED	PT2060/43	PT2060/53 (Default type)	PT2060/53 (Individual type)
CH1	CHANNEL-1-ALT	NOT OK (for 43 module)	NOT OK (for 43 module)
CH2	CHANNEL-1-DNG	NOT OK (for 43 module)	ALT
CH3	CHANNEL-2-ALT	DNG	SLOT1-DNG
CH4	CHANNEL-2-DNG	DNG	SLOT2-DNG
CH5	CHANNEL-3-ALT	ALT	SLOT3-DNG
CH6	CHANNEL-3-DNG	ALT	SLOT1-NOT OK
CH7	CHANNEL-4-ALT	NO USED	SLOT2-NOT OK
CH8	CHANNEL-4-DNG	NO USED	SLOT3-NOT OK

Comment: The two groups have the same definitions. The specific explanation refers to Appendix A.

Module Description

Hardware

PT2060/43 R-REALY redundant relay module consists of two parts, one PT2060/43-Front and PT2060/43-Back. There are 16 red LEDs on Front Panel that indicates relay status. Two additional green LEDs indicate the top and the bottom group relays OK status. There are there terminals on back panel for relay controlling output.

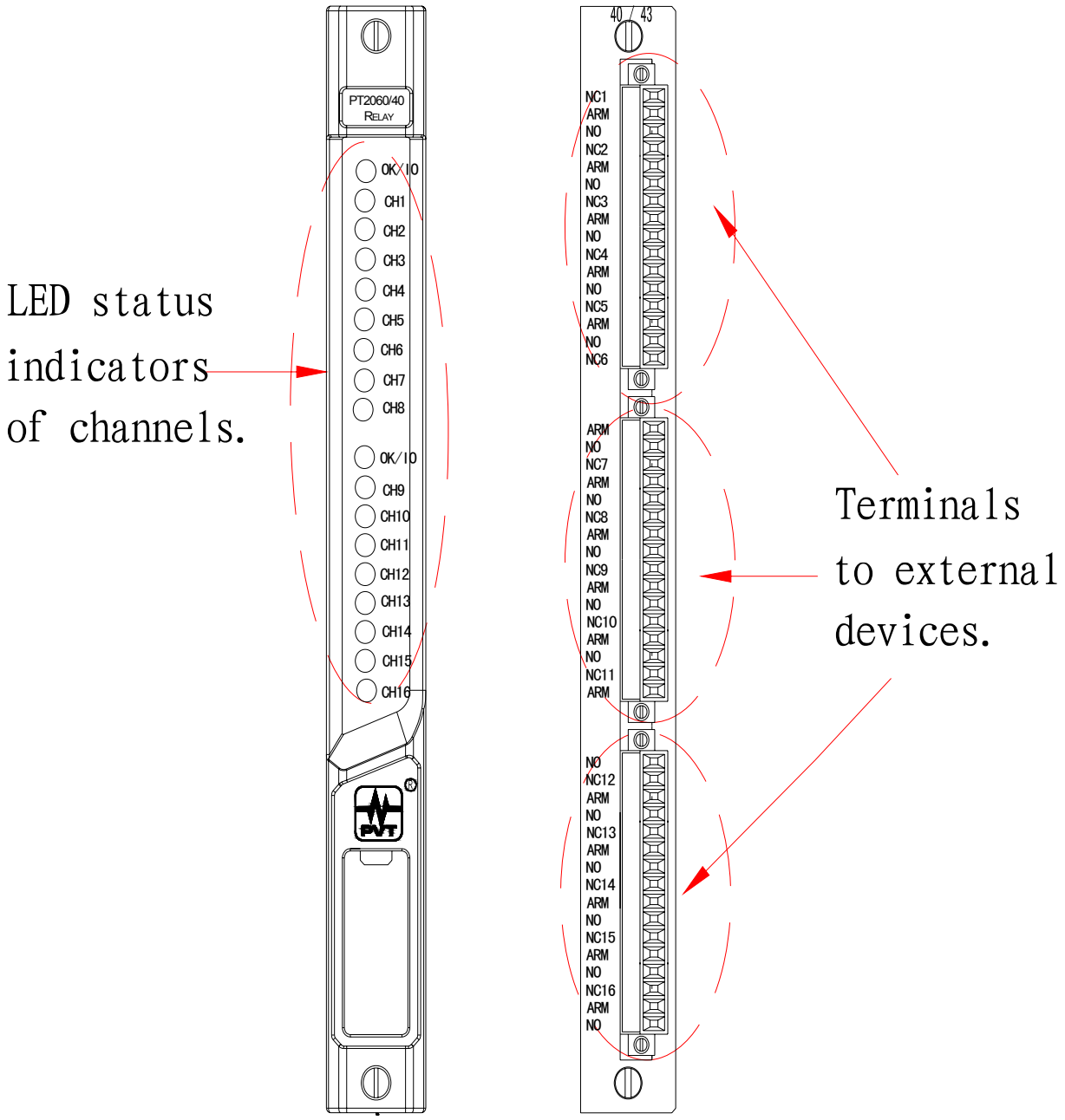


Figure 2 Front & back panel

LED on the front panel of relay module indicates the modules and channel statuses, as described below.

- ✓ OK / IO LED indicate whether the module and relay channels are okay.
  A steady OK / IO LED indicates that the module is working OK. If OK / IO LED flashes, the digital communications between module and system is OK
- ✓ If relay LED is on,
  It means that PT2060/43 redundant relay logic is true.

Software

The PT2060 System Configuration software can be used to configure the PT2060/43 R-REALY redundant relay module. Each relay can be independently configured.
Relay alarm can be defined as the following options to configure:

- ✓ Latch, non-latching
- ✓ Normally de-energized, normally energized
- ✓ Bypass, non-Bypass

Specification

Electrical

Power supply:
Internally converted by the rack power supply module
8.0W total typical for this module
Signal input:
Through internal bus or direct connection
Relays:
Seal: Epoxy
Capacity:
5A/240V or 5A/30V, resistance load
Relay type:
SPDT * 2; 8 sets
Isolation:
1000V/DC
LEDs:
OK / IO: green
ALARM: red
Approvals:
CE;
CSA:
Non-incendive, class I, div.2, Grps.ABCD, T4@Ta= -40℃ to +75℃
Certificate Number: 2011996

Physical

Each module comes with two components, the PT2060/43-Front assembly and the PT2060/43-Back assembly.

Dimension and Location:
241mm(9.5in)×24.5mm(0.96in)

For 19″ rack, they can be mounted in slot 4, 8, or slot 12.
For 12″ rack, they can be mounted only in slot 4.

Weight:
1.0kg (2.0 lbs).

Environmental

Temperature:
Operation: -20℃ to 65℃
Storage temperature: -40℃ to 85℃

Humidity:
95% non-condensing

Module Configuration and Channel Setup

PT2060/43 R-REALAY module will monitor status of the system, modules, and channels on the rack. It will also monitor channel alarms and sensor OK status. The communication is via. ProvibTech's proper digital protocol. PT2060 adopts the PLC hardware structure. The communication is fast and reliable.

In this chapter, the description of the configuration setting is based on PT2060 System Configuration.

Hardware Configuration

Each PT2060/43 R-REALY redundant relay module occupies a slot in the rack. A standard 19″ rack can contain up to three PT2060/43 REALAY modules. A valid communication connection should be established before the normal operating of the system.

To configure PT2060/43, communication between PT2060-CFG software and PT2060/43 module has to be established. This communication is normally setup via. PT2060/91, the system interface module. As Figure 3 shows, Computer will connect PT2060/91, the System Interface Module via the RS232 on the front panel or RS485 or RS232 on the back panel. Please consult PT2060/91 SIM user manual for more details.

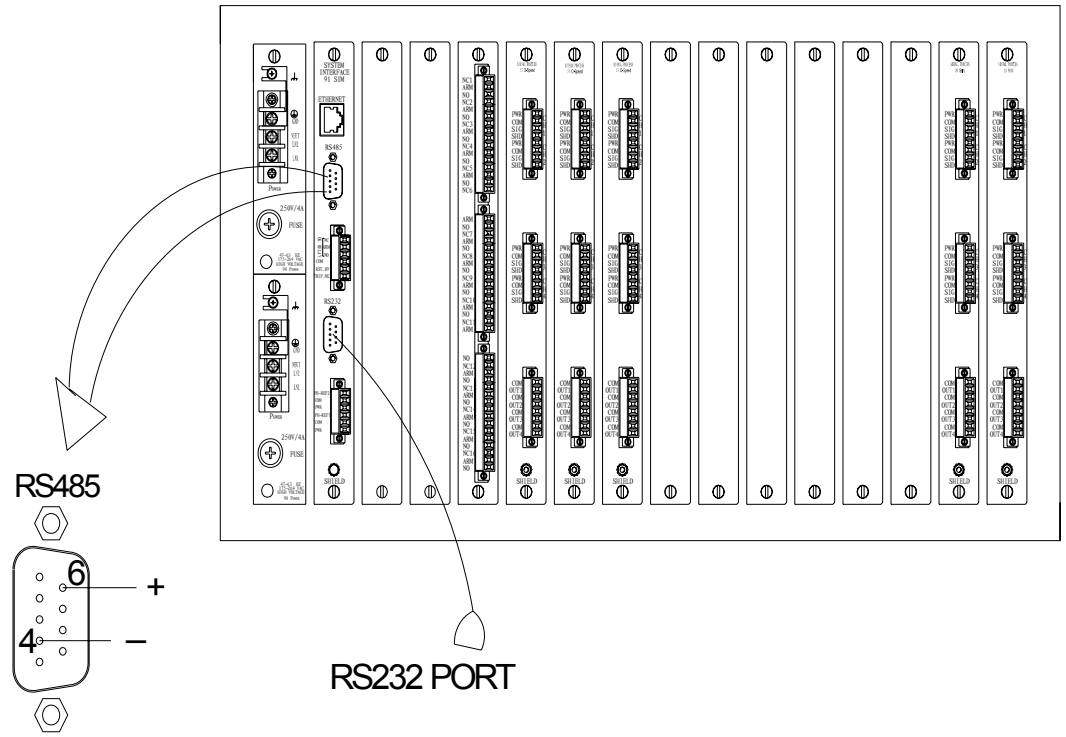


Figure 3

Module Configuration Setting

Configuration Software General Operation

PT2060 System Configure software is an important part of performing test and maintenance of PT2060. Via the software, PT2060 parameters are configured and the running status is displayed. For more detailed information, please refer to *PT2060 System Configure* software user manual.

The figure below is the main frame window of the software. There are seven main items in the window.

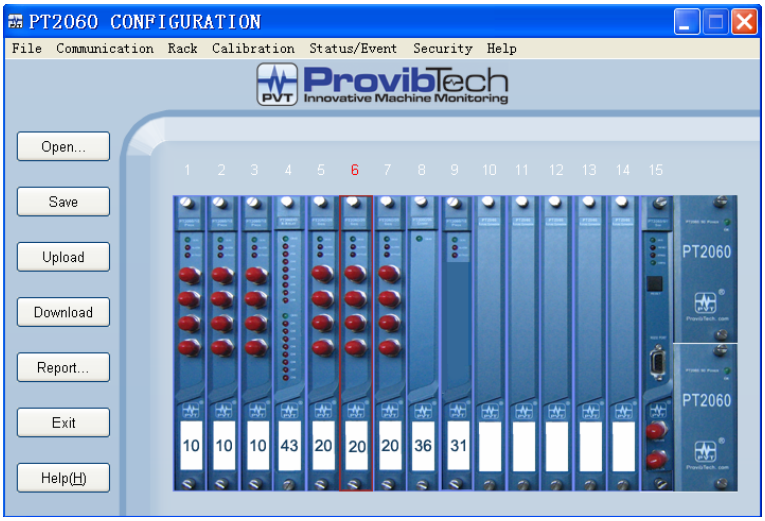


Figure 4

Menu item *File* relates to file operations such as open, save and save as of a configuration file. Also, the item *System Setup* in it is used to alternate the system measurement unit. See the figure below.

Figure 5

Menu item *Communication->Upload* is used to upload all configuration parameters from the PT2060 rack currently connected to the computer and *Communication->Download* is used to download all configuration parameters to the currently connected PT2060 rack.

From *Communication Setup*, connection with PT2060 monitor can be established. Setup communication parameters and click button *Download* to re-set the parameters for the PT2060 rack.

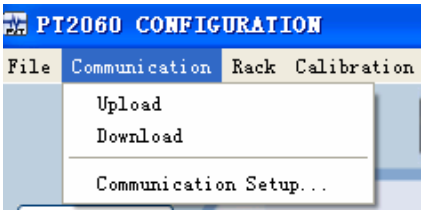


Figure 6

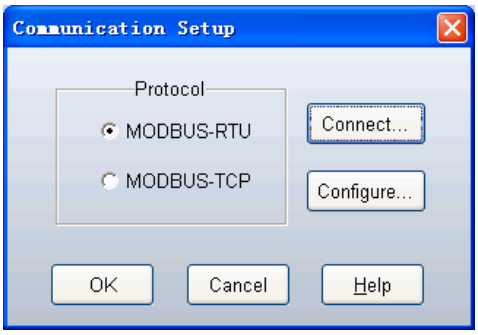


Figure 7

Menu item *Rack* relates to rack operations. Its sub items are listed below.

✓ Rack Clock Setup

Configure system clock of the PT2060 rack.

✓ Rack Reset

Reset all alarms of the PT2060 rack.

✓ Signal Module Control

Operations related to alarm bypass and multiply alarms.

✓ Self-Test

Let the rack go into self-test mode. This is useful for troubleshooting.

✓ Factory Information

Operations related to factory information.

✓ Customized Modbus Registers

Operations related to Modbus Registers of the rack.

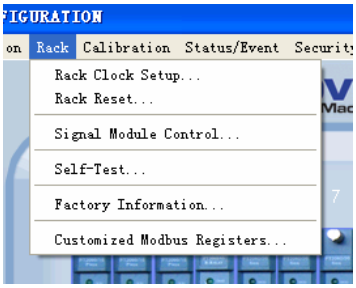


Figure 8

Menu item Calibration contains two subs, User Calibration and Factory Calibration. PT2060/31 TEMP module has no User Calibration.

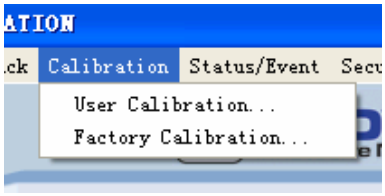


Figure 9

Menu item *Status/Event* contains operations related to current status and alarm events (recent 500 records), such as reading or deleting. Its sub item *Real-Time Value And Status* is used to display the messages of all channels. Sub item *Modbus Range Setup* is used to set a coefficient to PT2060 in order to make it compatible with other devices based on the standard Modbus.

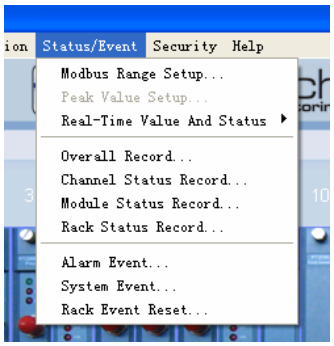


Figure 10

Item *Security* is used for security consideration. Here you can enter different passwords for different permissions. The Factory Password allows factory permission and is for the factory staff only. You can modify the passwords here and set effective time for them. If the period is expired, password has to be reentered to continue your working.

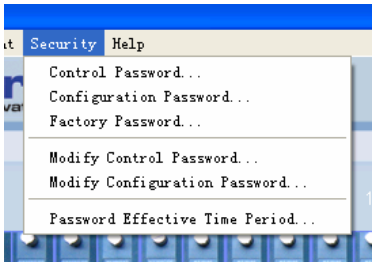


Figure 11

The item *Help* introduces detailed operation steps to the user. It is a quick way to become acquainted with the software.

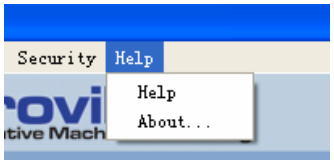


Figure 12

Functions

NOT OK

This indicates that fault has been detected by the associated R-REALY redundant relay Module channel. If the Channel OK status goes not OK, then the system OK Relay on the Rack PT2060/91 SIM Module will be driven not OK.

BYPASS

This indicates if any of the channels in PT2060/43 R-REALY redundant relay Module has been bypassed. Any of the following conditions can cause the Relay Module to be bypassed:

- ✓ The Relay Module is in configuration mode
- ✓ A fatal error was found during self-test
- ✓ Any active channel is bypassed

Latching relay

When this option is selected, the corresponding relay alarm channel will hold the alarm state until it receives a rack reset or the relay is reconfigured.

Parameter Configuration

After having connected the host computer and the PT2060, the PT2060 System Configuration software can be started. Click the button Upload and the messages of PT2060 will be uploaded to the software. Click the button Config and enter the proper password, the PT2060 will be changed to configuration status.

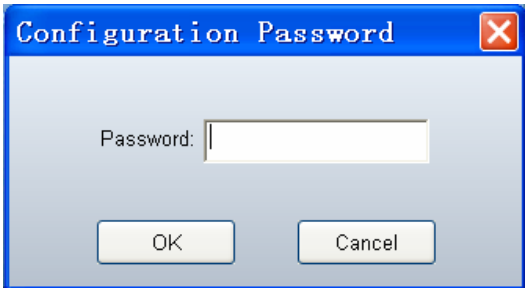


Figure 13

In the configuration status, right click on the picture of the module you want to configure will open a configuration window for that module, where all parameters can be edited.

Warning

PT2060 is unable to alarm and protect in configuration status!!!

Application Advisory

ProvibTech **recommends strongly** that the original configuration setting must be uploaded and saved before performing any modifications to PT2060/43 inner parameters.

Configuration Considerations

- ✓ Add monitor modules to the rack configuration before configuring the Relay Module.
- ✓ Generally, Bypassing relay channels is not recommended;

Bypass and Working Mode Configuration

Relay's working mode

PT2060/43 R-REALY redundant relay module has two working mode, energized and non-energized. This indicates how to set relay hardware switch for relay I/O module. Default mode is non-energized.

Relay bypass

Bypass is used to bypass or prohibit relative channels. If this is enabled, corresponding relays will be prohibited from working. This is not recommended. After that, press "download" button to download the configuration information. Uploading and verifying these configuring information are recommended. Figure shown as follows:

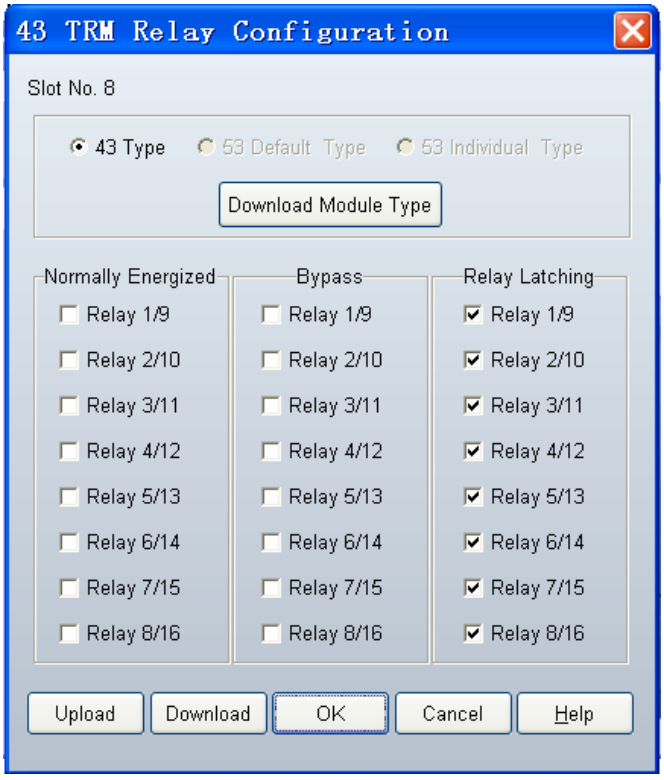


Figure 14

Normal Energized

Configuration password should be enabled and enter the configuration model before configuring Relay Energized mode, When enabled, relative channels Relay will keep normal energized ,the default is normal non-energized .Setup relative relays. Then download the configuration. Press OK to finish the procedure.

Latch relay

Control password should be enabled before configuration Relay Latch mode, when enabled, relative channels will keep alarm status till it receives a rack reset or is reconfigured. This function is used for monitors' alarm latching. Pressing system reset button will cancel the alarm. Setup relative relays. Then download the configuration. Press OK to finish the procedure.

Channels' Status

When PT2060 system is running normally, each relay channel status can be displayed in the real time value and status interface. Detail information refers to software manual. See Channel Status Record below.

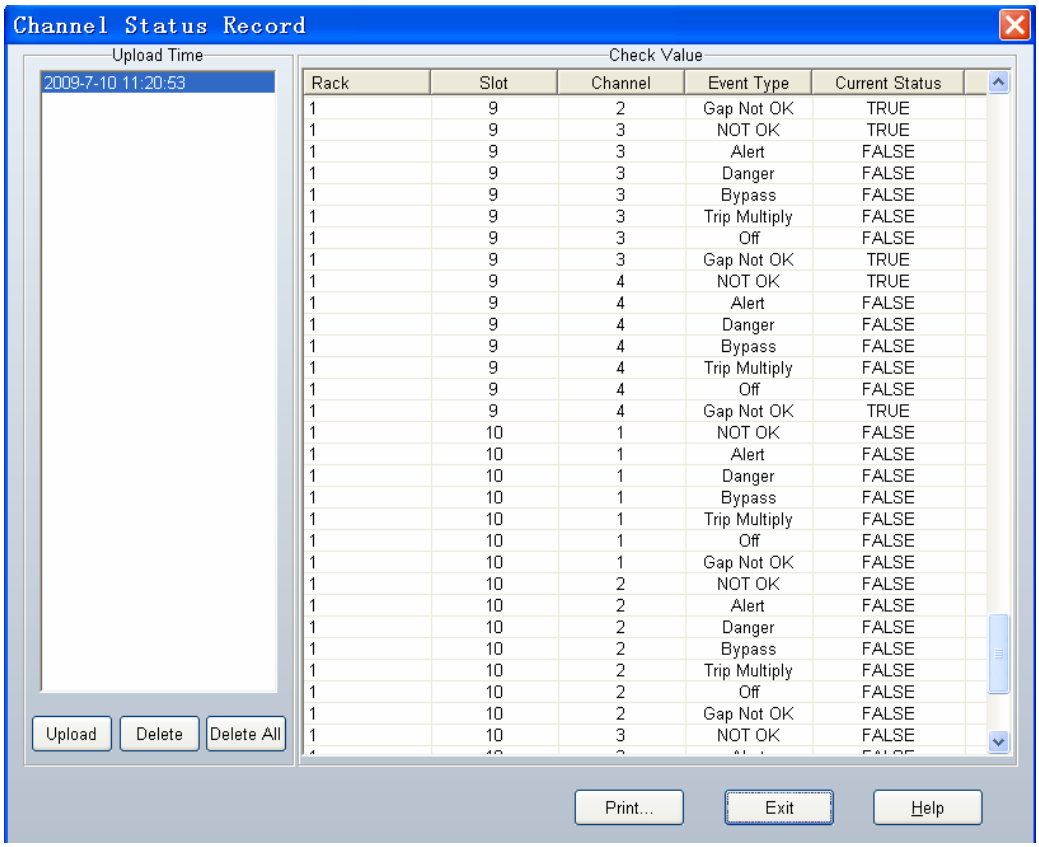

Channel Status Record
Upload Time
2009-7-10 11:20:53
Upload
Delete
Delete All
Check Value
Rack Slot Channel Event Type Current Status
1 9 2 Gap Not OK TRUE
1 9 3 NOT OK TRUE
1 9 3 Alert FALSE
1 9 3 Danger FALSE
1 9 3 Bypass FALSE
1 9 3 Trip Multiply FALSE
1 9 3 Off FALSE
1 9 3 Gap Not OK TRUE
1 9 4 NOT OK TRUE
1 9 4 Alert FALSE
1 9 4 Danger FALSE
1 9 4 Bypass FALSE
1 9 4 Trip Multiply FALSE
1 9 4 Off FALSE
1 9 4 Gap Not OK TRUE
1 10 1 NOT OK FALSE
1 10 1 Alert FALSE
1 10 1 Danger FALSE
1 10 1 Bypass FALSE
1 10 1 Trip Multiply FALSE
1 10 1 Off FALSE
1 10 1 Gap Not OK FALSE
1 10 2 NOT OK FALSE
1 10 2 Alert FALSE
1 10 2 Danger FALSE
1 10 2 Bypass FALSE
1 10 2 Trip Multiply FALSE
1 10 2 Off FALSE
1 10 2 Gap Not OK FALSE
1 10 3 NOT OK FALSE
Print...
Exit
Help

Figure 15

Hardware Module Operation

This section describes I/O modules with direct relation to redundant relay module and how to connect them.

PT2060/43 R-REALY redundant relay back IO module:

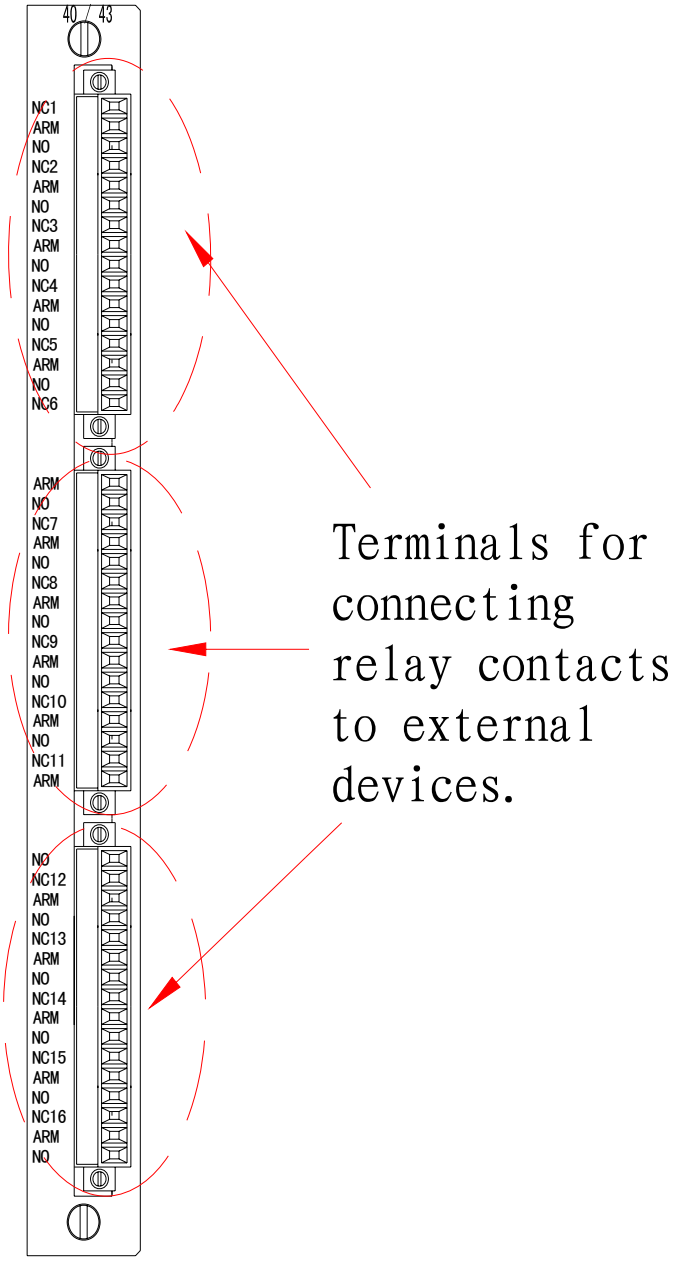


Figure16

WARNING

High voltage may be present. Contact could cause shock, burn, or death. Do not touch exposed wires or terminals. Remove all power when working with the module.

To remove a terminal block from its base, loosen the screws attaching the terminal block to the base, grip the block firmly and pull. Do not pull the block out by its wires because this could loosen or damage the wires or connector.

NOTICE

Relay contacts categorize NC (normal close), NO (normal open) and ARM (armature). NC and NO define the armature contact status. In this case, the relay coil is not powered.

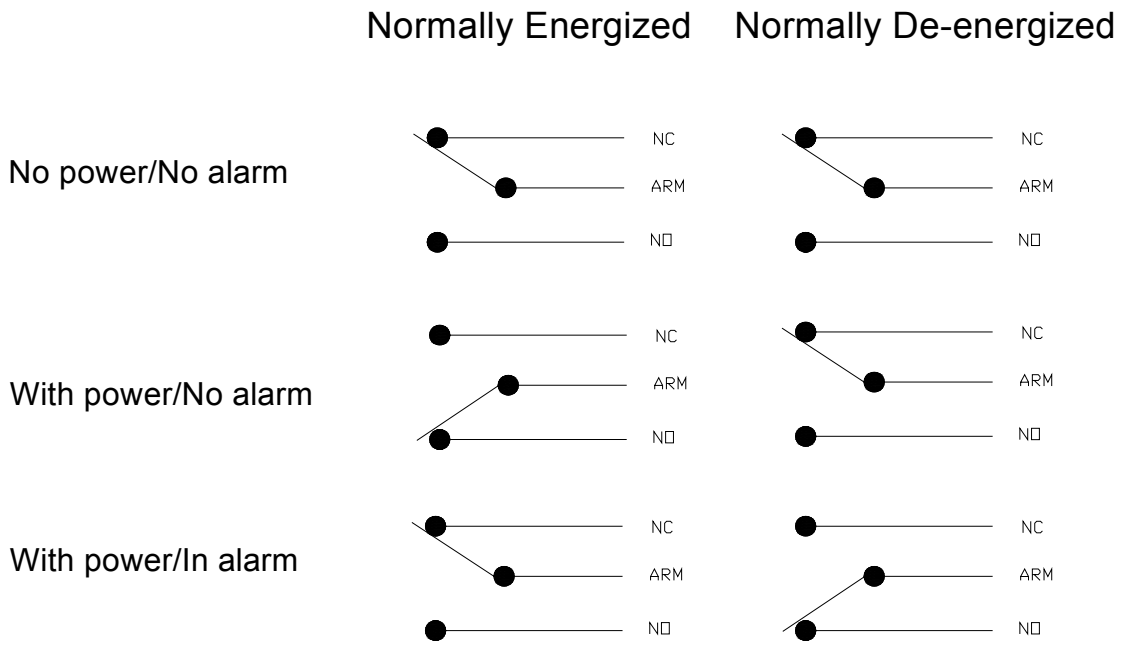


Figure 17

Maintenance

Instruction

User should not repair components inside a PT2060/43 RELAY module. The maintenance described here covers the test of the module and check whether it works properly. But if the module behaves abnormal, User has to replace it by a new one.

- ✓ Periodic maintenance
- ✓ Tool preparations
- ✓ Build of the maintenance environment
- ✓ Configuration software operating
- ✓ Module test
- ✓ Exceptional module treatment

Periodic Maintenance

This maintenance interval is very important for the module maintenance. Usually, a yearly maintenance is sufficient. If PT2060/43 RELAY module works in extraordinary circumstance, user should shorten the interval according to the actual situation.

Extraordinary circumstance means that

- ✓ PT2060 is used to monitor some critical equipment
- ✓ PT2060 works in high temperature, high humidity, and corrosive environment

Besides, maintenance interval should be adjusted according to plant maintenance period.

Application Advisory

ProvibTech **recommends strongly** that the original configuration setting must be uploaded and saved before performing any modification to it and restore it after maintenance has been done!

Troubleshooting

This section describes how to use the LED, and System Event List to troubleshoot a problem with PT2060/43 RELAY module or the Output module.

LED

LED located on the front panel are OK / IO LED, Alarm LED. They indicate directly the PT2060/43 RELAY module working status. If something abnormal, user could analyze it and solve some problems.

OK / IO GREEN LED

Flash: All channels are ok. Digital communication is ok.
On without flash: All channels are ok. No digital communication. This means there are problems in communication.
Off: One or more channels are not ok.

ALARM RED LED

On: One or more channels are in alert or danger.
Off: All channels on the module are in normal status. No alarms engaged.

If ALARM RED LED does not work normally, it may be caused by this: the module is failed. Try these to solve it: remount the module; reset it; check the probe and cable.

System Events List

The System event list of PT2060/43 RELAY module could be seen in the *PT2060 System Configuration* software. This list contains the recent 500 events.
Click menu item Status/Event->System Event of the software to open a new window like the figure below.

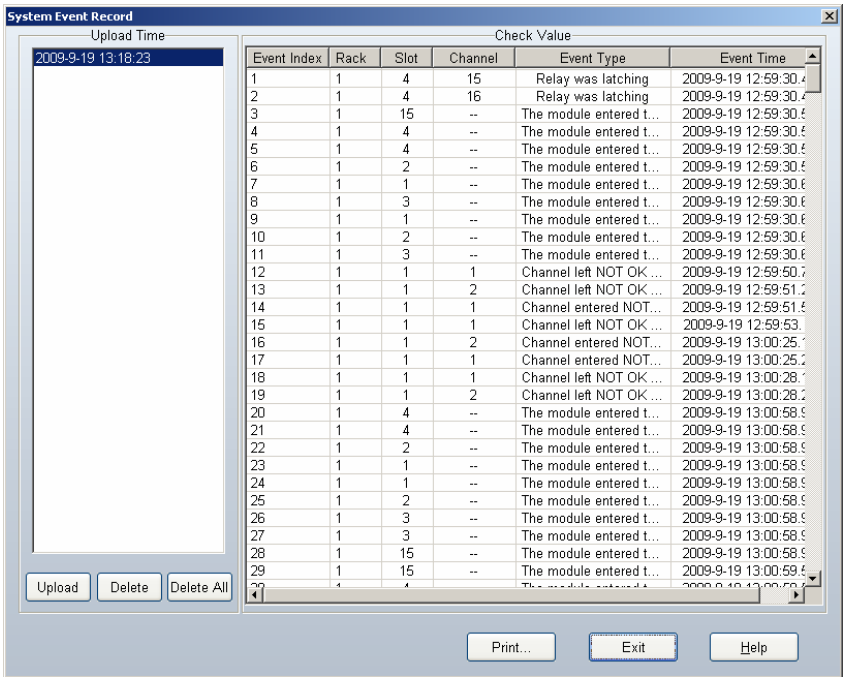

System Event Record
Upload Time
2009-9-19 13:18:23
Upload
Delete
Delete All
Check Value
Event Index | Rack | Slot | Channel | Event Type | Event Time
1 | 1 | 4 | 15 | Relay was latching | 2009-9-19 12:59:30.
2 | 1 | 4 | 16 | Relay was latching | 2009-9-19 12:59:30.
3 | 1 | 15 | -- | The module entered t... | 2009-9-19 12:59:30.
4 | 1 | 4 | -- | The module entered t... | 2009-9-19 12:59:30.
5 | 1 | 4 | -- | The module entered t... | 2009-9-19 12:59:30.
6 | 1 | 2 | -- | The module entered t... | 2009-9-19 12:59:30.
7 | 1 | 1 | -- | The module entered t... | 2009-9-19 12:59:30.
8 | 1 | 3 | -- | The module entered t... | 2009-9-19 12:59:30.
9 | 1 | 1 | -- | The module entered t... | 2009-9-19 12:59:30.
10 | 1 | 2 | -- | The module entered t... | 2009-9-19 12:59:30.
11 | 1 | 3 | -- | The module entered t... | 2009-9-19 12:59:30.
12 | 1 | 1 | 1 | Channel left NOT OK ... | 2009-9-19 12:59:50.
13 | 1 | 1 | 2 | Channel left NOT OK ... | 2009-9-19 12:59:51.
14 | 1 | 1 | 1 | Channel entered NOT... | 2009-9-19 12:59:51.
15 | 1 | 1 | 1 | Channel left NOT OK ... | 2009-9-19 12:59:53.
16 | 1 | 1 | 2 | Channel entered NOT... | 2009-9-19 13:00:25.
17 | 1 | 1 | 1 | Channel entered NOT... | 2009-9-19 13:00:25.
18 | 1 | 1 | 1 | Channel left NOT OK ... | 2009-9-19 13:00:28.
19 | 1 | 1 | 2 | Channel left NOT OK ... | 2009-9-19 13:00:28.
20 | 1 | 4 | -- | The module entered t... | 2009-9-19 13:00:58.
21 | 1 | 4 | -- | The module entered t... | 2009-9-19 13:00:58.
22 | 1 | 2 | -- | The module entered t... | 2009-9-19 13:00:58.
23 | 1 | 1 | -- | The module entered t... | 2009-9-19 13:00:58.
24 | 1 | 1 | -- | The module entered t... | 2009-9-19 13:00:58.
25 | 1 | 2 | -- | The module entered t... | 2009-9-19 13:00:58.
26 | 1 | 3 | -- | The module entered t... | 2009-9-19 13:00:58.
27 | 1 | 3 | -- | The module entered t... | 2009-9-19 13:00:58.
28 | 1 | 15 | -- | The module entered t... | 2009-9-19 13:00:58.
29 | 1 | 15 | -- | The module entered t... | 2009-9-19 13:00:59.
Print...
Exit
Help

Figure 18

Click the button *Upload* at left-bottom corner of the window to obtain the new System events. In the left area, there is a list of upload time which is the time you perform an upload from PT2060 rack. Click one of these items to get its detail event list in the right field. Event without channel number means it does not concern any channel. By browsing this event list, you will be able to know what happened recently. It may help the user to solve some problems. The right each list means below:

Rack no. : rack address.

Event no. : existed system event code.

Module no.: module code where the system event has occurred.

Channel no.: channel code where the system event has occurred.

Event Type: explaining the system event meaning.

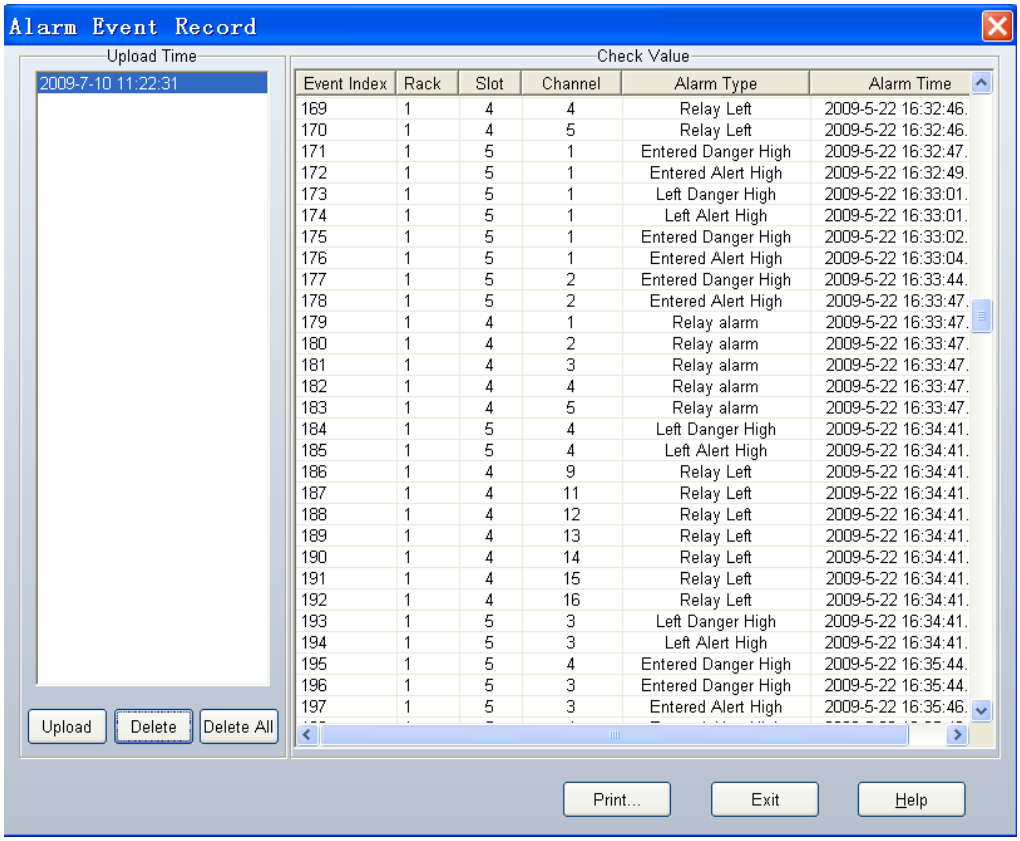
Time: when does the system event happen.

If you could not solve the problem by yourself, please save these message for our service staff.

Alarm Event List

Like System event, the software deals with alarm event list in the same way. It also keeps 500 recent alarm events.

Click menu item Status/Event->Alarm Event of the software to open a new window like the figure below.



Event Index	Rack	Slot	Channel	Alarm Type	Alarm Time
169	1	4	4	Relay Left	2009-5-22 16:32:46.
170	1	4	5	Relay Left	2009-5-22 16:32:46.
171	1	5	1	Entered Danger High	2009-5-22 16:32:47.
172	1	5	1	Entered Alert High	2009-5-22 16:32:49.
173	1	5	1	Left Danger High	2009-5-22 16:33:01.
174	1	5	1	Left Alert High	2009-5-22 16:33:01.
175	1	5	1	Entered Danger High	2009-5-22 16:33:02.
176	1	5	1	Entered Alert High	2009-5-22 16:33:04.
177	1	5	2	Entered Danger High	2009-5-22 16:33:44.
178	1	5	2	Entered Alert High	2009-5-22 16:33:47.
179	1	4	1	Relay alarm	2009-5-22 16:33:47.
180	1	4	2	Relay alarm	2009-5-22 16:33:47.
181	1	4	3	Relay alarm	2009-5-22 16:33:47.
182	1	4	4	Relay alarm	2009-5-22 16:33:47.
183	1	4	5	Relay alarm	2009-5-22 16:33:47.
184	1	5	4	Left Danger High	2009-5-22 16:34:41.
185	1	5	4	Left Alert High	2009-5-22 16:34:41.
186	1	4	9	Relay Left	2009-5-22 16:34:41.
187	1	4	11	Relay Left	2009-5-22 16:34:41.
188	1	4	12	Relay Left	2009-5-22 16:34:41.
189	1	4	13	Relay Left	2009-5-22 16:34:41.
190	1	4	14	Relay Left	2009-5-22 16:34:41.
191	1	4	15	Relay Left	2009-5-22 16:34:41.
192	1	4	16	Relay Left	2009-5-22 16:34:41.
193	1	5	3	Left Danger High	2009-5-22 16:34:41.
194	1	5	3	Left Alert High	2009-5-22 16:34:41.
195	1	5	4	Entered Danger High	2009-5-22 16:35:44.
196	1	5	3	Entered Danger High	2009-5-22 16:35:44.
197	1	5	3	Entered Alert High	2009-5-22 16:35:46.

Figure 19

Click the button *Upload* at left-bottom corner of the window to obtain the new Alarm events. In the left field, there is a list of upload time which is the time you perform an upload from PT2060 rack. Click one of these items to get its detail event list in the right field. By browsing this event list, you will be able to know what happened recently. It may help you to solve your problem.

Each list meaning on the right is the same as system event list.

If you could not solve the problem by yourself, please save these message for our service staff.

Exceptional Module Treatment

If any problem is discovered in the above test, Please contact the closer ProvibTech office.

Ordering Information

Each PT2060/43 relay module consists of two boards, PT2060/43-Front and PT2060/43-Back.

PT2060/43-AX

AX: Back-panel IO module

A0: Basic IO module

Accessories

There are several accessories for selecting:

PT2060-004300: PT2060/43 Front panel

PT2060-004001: PT2060/40/43 Back panel

Appendix

PT2060/43 Led Definition

Definition of 43 LED

PT2060/43 R-RELAY Redundant-Relay module has two groups of LED, they have the following meaning when it works in 43 mode.

NOTE: LOGIC_CHANNEL1 is that each first channel of three signal modules consists of being one logic channel when PT2060/43 R-RELAY Redundant-Relay module combines redundant system with the other three signal modules.

	GREEN_ LED	OK / IO
CH1	RED_LED_1	LOGIC_CHANNEL1_ALT
CH2	RED_LED_2	LOGIC_CHANNEL1_DNG
CH3	RED_LED_3	LOGIC_CHANNEL2_ALT
CH4	RED_LED_4	LOGIC_CHANNEL2_DNG
CH5	RED_LED_5	LOGIC_CHANNEL3_ALT
CH6	RED_LED_6	LOGIC_CHANNEL3_DNG
CH7	RED_LED_7	LOGIC_CHANNEL4_ALT
CH8	RED_LED_8	LOGIC_CHANNEL4_DNG
	GREEN_LED	OK / IO
CH9	RED_LED_9	LOGIC_CHANNEL1_ALT
CH10	RED_LED_10	LOGIC_CHANNEL1_DNG
CH11	RED_LED_11	LOGIC_CHANNEL2_ALT
CH12	RED_LED_12	LOGIC_CHANNEL2_DNG
CH13	RED_LED_13	LOGIC_CHANNEL3_ALT
CH14	RED_LED_14	LOGIC_CHANNEL3_DNG
CH15	RED_LED_15	LOGIC_CHANNEL4_ALT
CH16	RED_LED_16	LOGIC_CHANNEL4_DNG

Definition of 53 Default LED

PT2060/43 R-RELAY Redundant-Relay module has two groups of LED. They have the following meaning when it works in 53 default mode.

	GREEN_LED	OK / IO
CH1	RED_LED_1	NOT OK (for 43 module)
CH2	RED_LED_2	NOT OK (for 43 module)
CH3	RED_LED_3	LOGIC_CH1_DNG
CH4	RED_LED_4	LOGIC_CH1_DNG
CH5	RED_LED_5	LOGIC_CH1_ALT
CH6	RED_LED_6	LOGIC_CH1_ALT
CH7	RED_LED_7	No used
CH8	RED_LED_8	No used

	GREEN_LED	OK / IO
CH9	RED_LED_9	NOT OK (for 43 module)
CH10	RED_LED_10	NOT OK (for 43 module)
CH11	RED_LED_11	LOGIC_CH1_DNG
CH12	RED_LED_12	LOGIC_CH1_DNG
CH13	RED_LED_13	LOGIC_CH1_ALT
CH14	RED_LED_14	LOGIC_CH1_ALT
CH15	RED_LED_15	No used
CH16	RED_LED_16	No used

Definition of 53 individual LED

PT2060/43 R-RELAY Redundant-Relay module has two groups of LED, they have the following meaning when it works in 53 individual mode.

NOTE:

SLOT(n) is first channel of first signal module when PT2060/43 R-RELAY Redundant-Relay module combines redundant system with the other three signal modules.

	GREEN_LED	OK / IO
CH1	RED_LED_1	NOT OK(for 43 module)
CH2	RED_LED_2	LOGIC_CH1_ALT
CH3	RED_LED_3	SLOT(n)_DNG
CH4	RED_LED_4	SLOT(n+1) _DNG
CH5	RED_LED_5	SLOT(n+2) _DNG
CH6	RED_LED_6	SLOT(n)_NOT OK
CH7	RED_LED_7	SLOT(n+1) _NOT OK
CH8	RED_LED_8	SLOT(n+2) _NOT OK
	GREEN_LED	OK / IO
CH9	RED_LED_9	NOT OK(for 43 module)
CH10	RED_LED_10	LOGIC_CH1_ALT
CH11	RED_LED_11	SLOT(n)_DNG
CH12	RED_LED_12	SLOT(n+1) _DNG
CH13	RED_LED_13	SLOT(n+2) _DNG
CH14	RED_LED_14	SLOT(n)_NOT OK
CH15	RED_LED_15	SLOT(n+1) _NOT OK
CH16	RED_LED_16	SLOT(n+2) _NOT OK

PT2060/43 Led and Relay Definition

Definition of 43 Relays

PT2060/43 R-RELAY Redundant-Relay module has two groups of relays, they have the following meaning when it works in 43 mode.

RELAY _1	LOGIC_CHANNEL1_ALT
RELAY _2	LOGIC_CHANNEL1_DNG
RELAY _3	LOGIC_CHANNEL2_ALT
RELAY _4	LOGIC_CHANNEL2_DNG
RELAY _5	LOGIC_CHANNEL3_ALT
RELAY _6	LOGIC_CHANNEL3_DNG
RELAY _7	LOGIC_CHANNEL4_ALT
RELAY _8	LOGIC_CHANNEL4_DNG
RELAY _9	LOGIC_CHANNEL1_ALT
RELAY _10	LOGIC_CHANNEL1_DNG
RELAY _11	LOGIC_CHANNEL2_ALT
RELAY _12	LOGIC_CHANNEL2_DNG
RELAY _13	LOGIC_CHANNEL3_ALT
RELAY _14	LOGIC_CHANNEL3_DNG
RELAY _15	LOGIC_CHANNEL4_ALT
RELAY _16	LOGIC_CHANNEL4_DNG

Definition of 53 Default Relays

PT2060/53 R-RELAY Redundant-Relay module has two groups of relays, both have the following meaning when it works in 53 default mode.

RELAY _1	NOT OK (for 43 module)
RELAY _2	NOT OK (for 43 module)
RELAY _3	LOGIC_CH1_DNG
RELAY _4	LOGIC_CH1_DNG
RELAY _5	LOGIC_CH1_ALT
RELAY _6	LOGIC_CH1_ALT
RELAY _7	No used
RELAY _8	No used
RELAY _9	NOT OK (for 43 module)
RELAY _10	NOT OK (for 43 module)
RELAY _11	LOGIC_CH1_DNG
RELAY _12	LOGIC_CH1_DNG
RELAY _13	LOGIC_CH1_ALT
RELAY _14	LOGIC_CH1_ALT
RELAY _15	No used
RELAY _16	No used

Definition of 53 individual Relays

PT2060/53 R-RELAY Redundant-Relay module has two groups of relays, both have the following meaning when it works in 53 individual mode.

RELAY _1	NOT OK (for 43 module)
RELAY _2	LOGIC_CH1_ALT
RELAY _3	SLOT(n)_CH1_DNG
RELAY _4	SLOT(n+1)_CH1 _DNG
RELAY _5	SLOT(n+2)_CH1 _DNG
RELAY _6	SLOT(n)_CH1_NOT OK
RELAY _7	SLOT(n+1)_CH1_NOT OK
RELAY _8	SLOT(n+2)_CH1_NOT OK
RELAY _9	NOT OK
RELAY _10	LOGIC_CH1_ALT
RELAY _11	SLOT(n)_CH1_DNG
RELAY _12	SLOT(n+1)_CH1_DNG
RELAY _13	SLOT(n+2)_CH1_DNG
RELAY _14	SLOT(n)_CH1_NOT OK
RELAY _15	SLOT(n+1)_CH1_NOT OK
RELAY _16	SLOT(n+2)_CH1_NOT OK